

FIG. 1

**PROCESS OF PREPARING POLYUREA MICROCAPSULES**

**Mixing a surfactant and a cross-linking agent to make a first mixture**



**Adding an active ingredient and an isocyanate compound to a solvent to make a second mixture**



**Combining the first mixture with the second mixture to make a third mixture**



**Emulsifying the third mixture**



**Curing the emulsified third mixture**



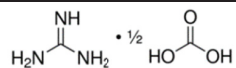
**Filtering the cured third mixture**



**Drying the filtered third mixture**

FIG. 2

1% PSS\* Surfactant + Guanidine carbonate salt



Glyceryl tributryate

← Citrepel/Etofenprox

← Takenate D-110N

---- Emulsified (6,500 rpm, 2min)  
→ Emulsion

---- Stirring at room temp. (10-15 min)  
→ Polyurea capsule

---- Cured at 55°C for 2h

Polyurea Capsule slurry

---- Filtered and dried at room temp.

Polyurea Capsule powder

FIG. 3

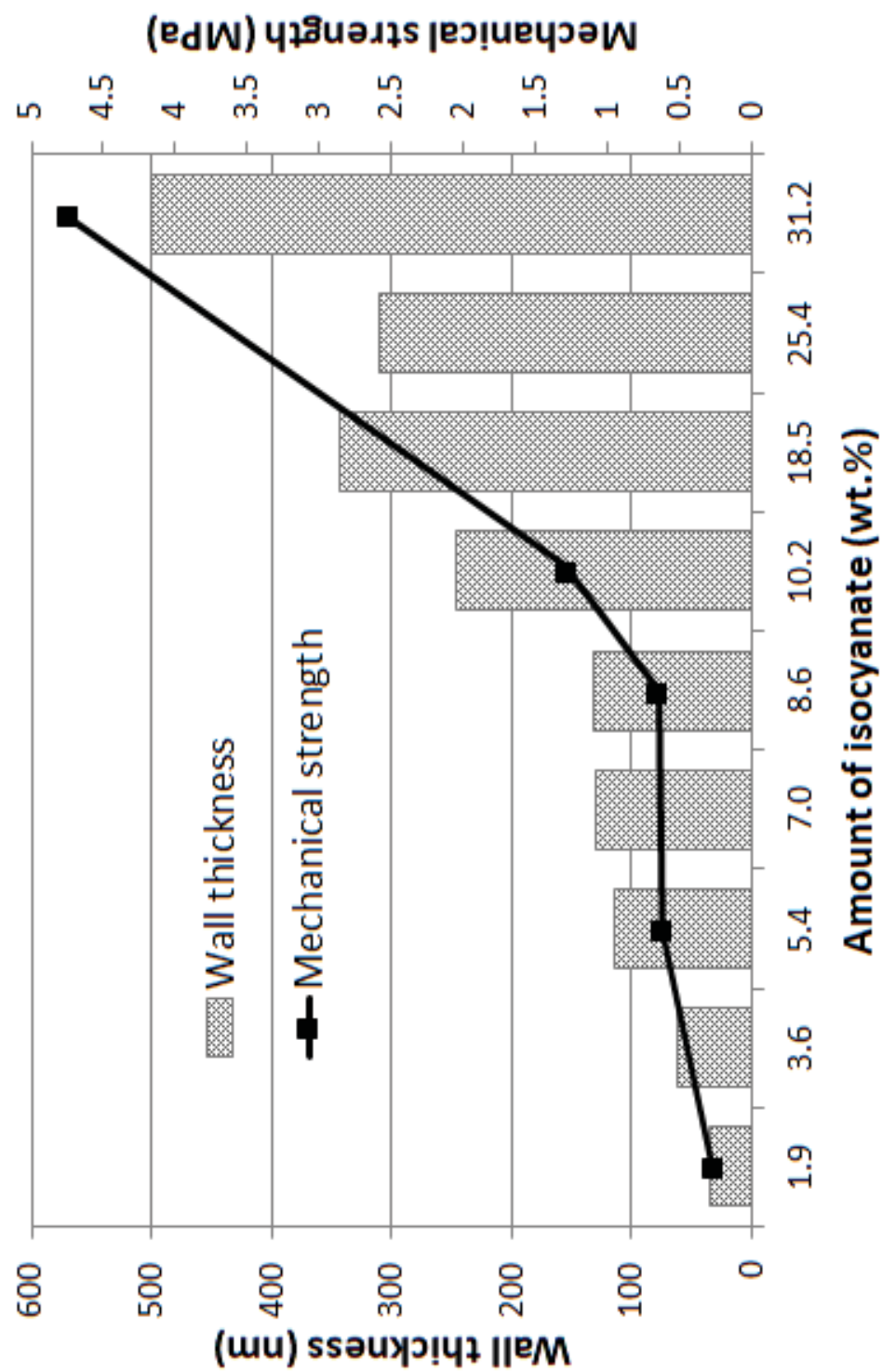


FIG. 4

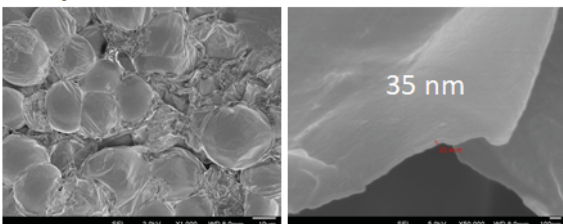
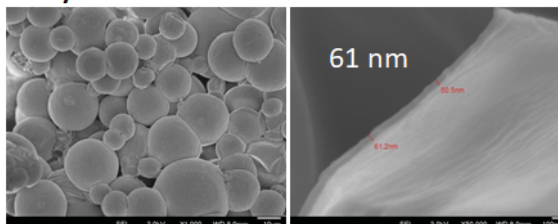
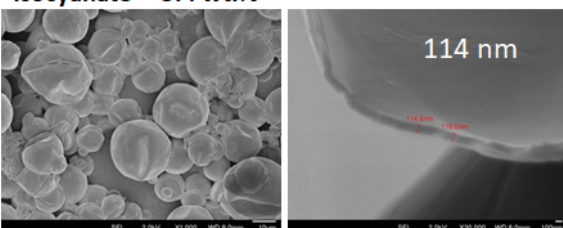
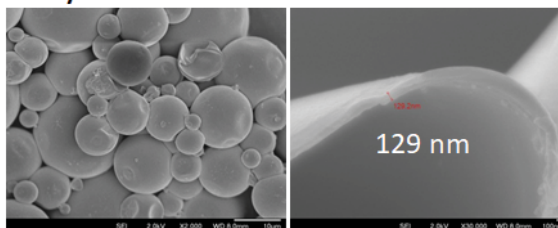
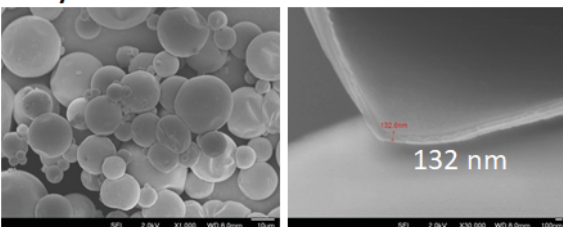
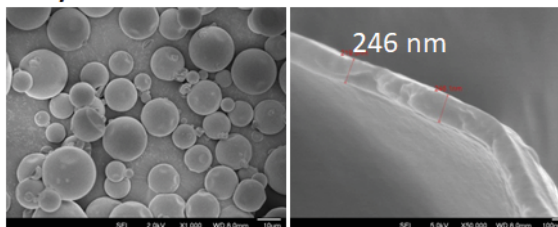
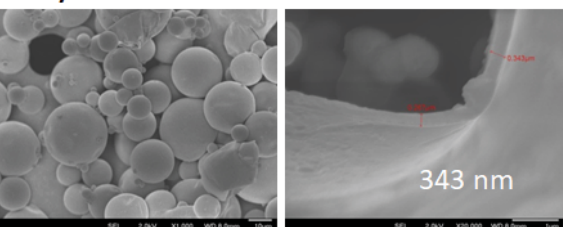
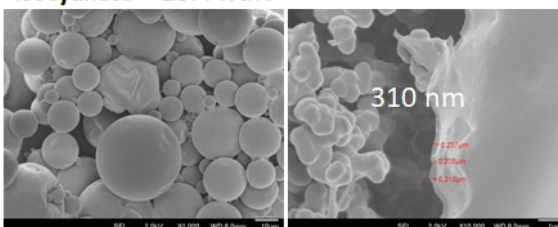
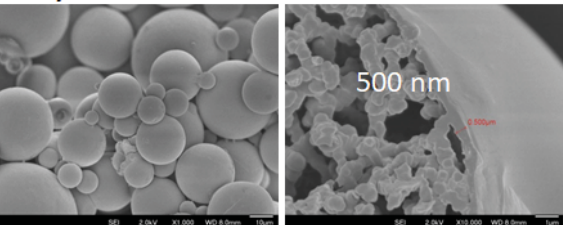
**Isocyanate – 1.9 wt.%****Isocyanate – 3.6 wt.%****Isocyanate – 5.4 wt.%****Isocyanate – 7 wt.%****Isocyanate – 8.6 wt.%****Isocyanate – 10.2 wt.%****Isocyanate – 18.5 wt.%****Isocyanate – 25.4 wt.%****Isocyanate – 31.2 wt.%**

FIG. 5

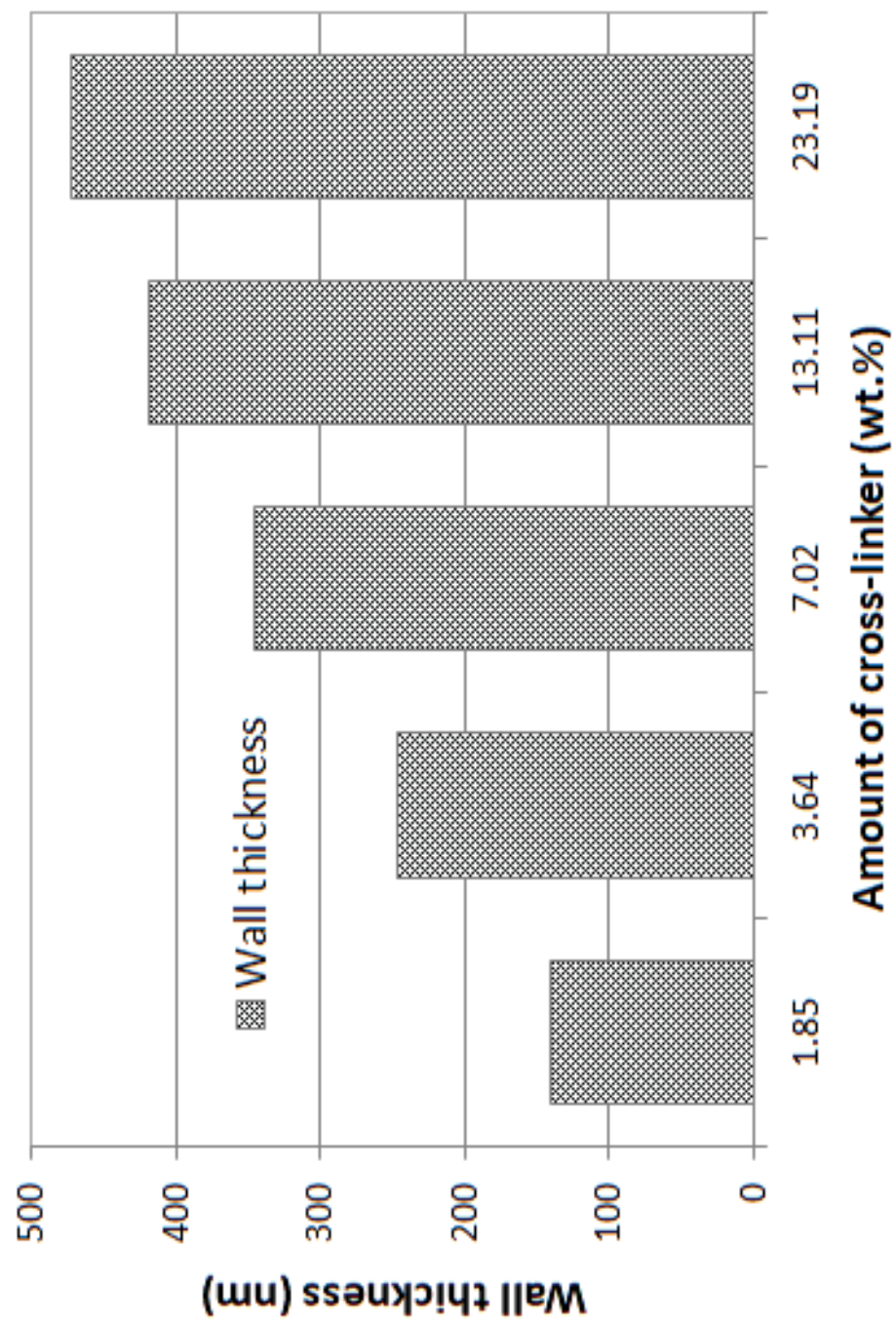
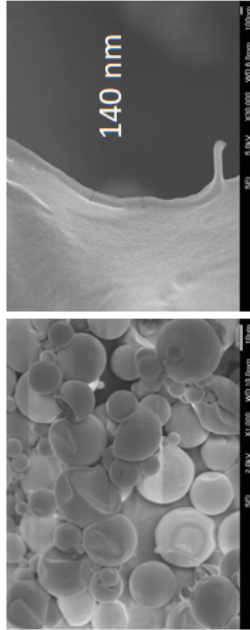
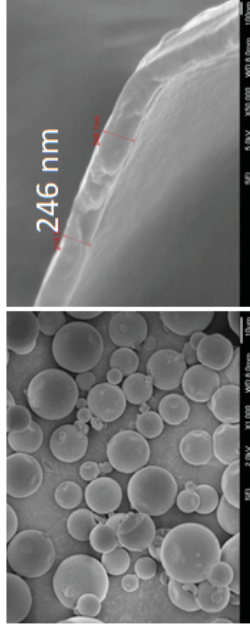


FIG. 6

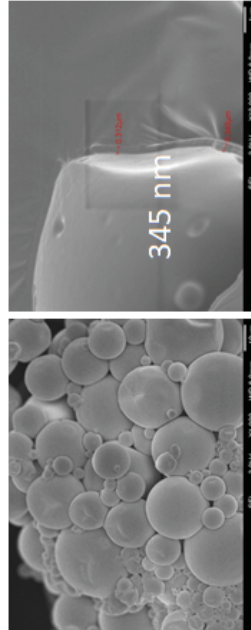
Cross-linker – 1.85 wt. %



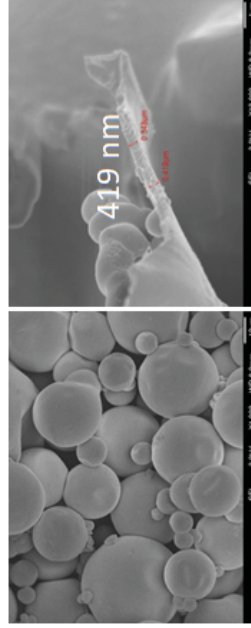
Cross-linker – 3.64 wt. %



Cross-linker – 7.02 wt. %



Cross-linker – 13.11 wt. %



Cross-linker – 23.19 wt. %

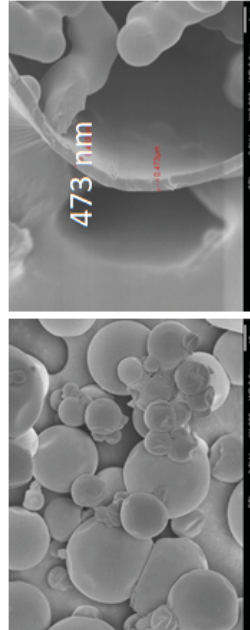


FIG. 7

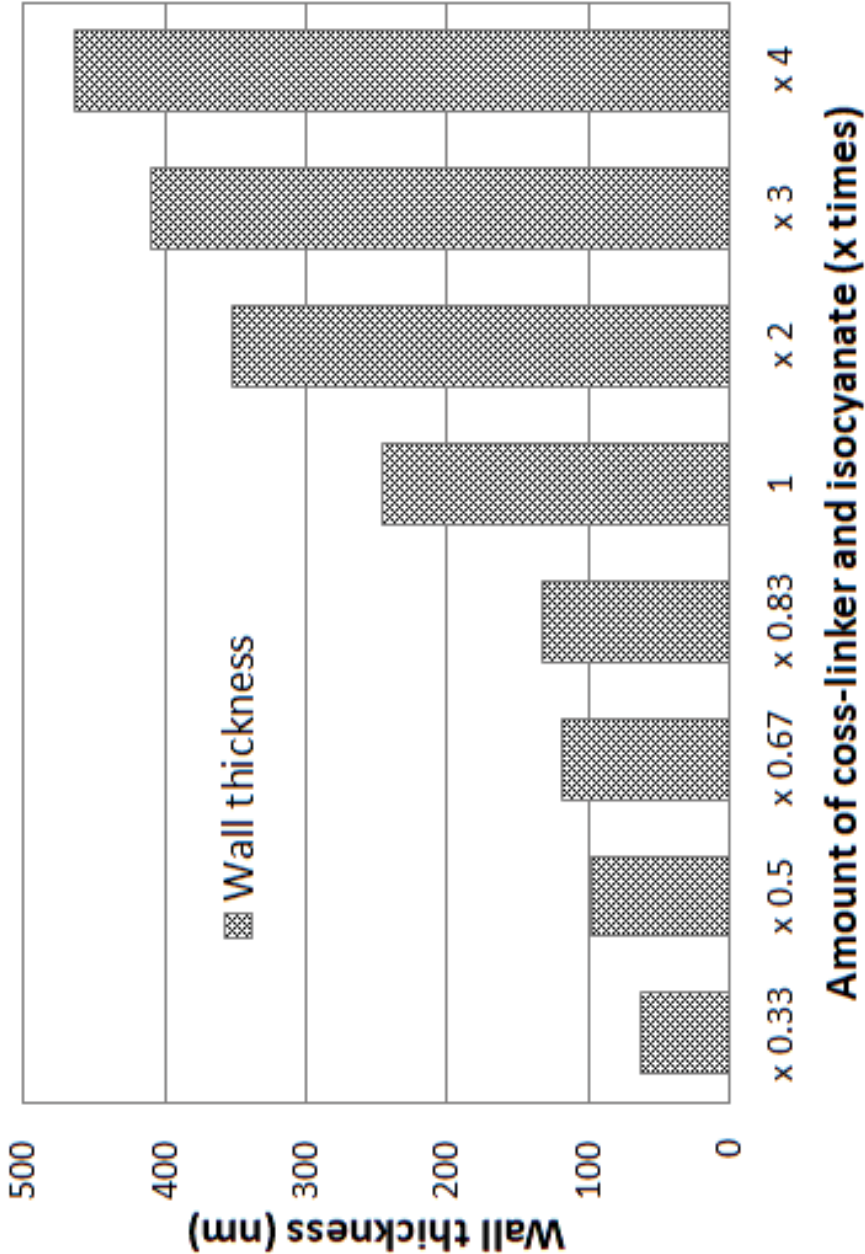


FIG. 8

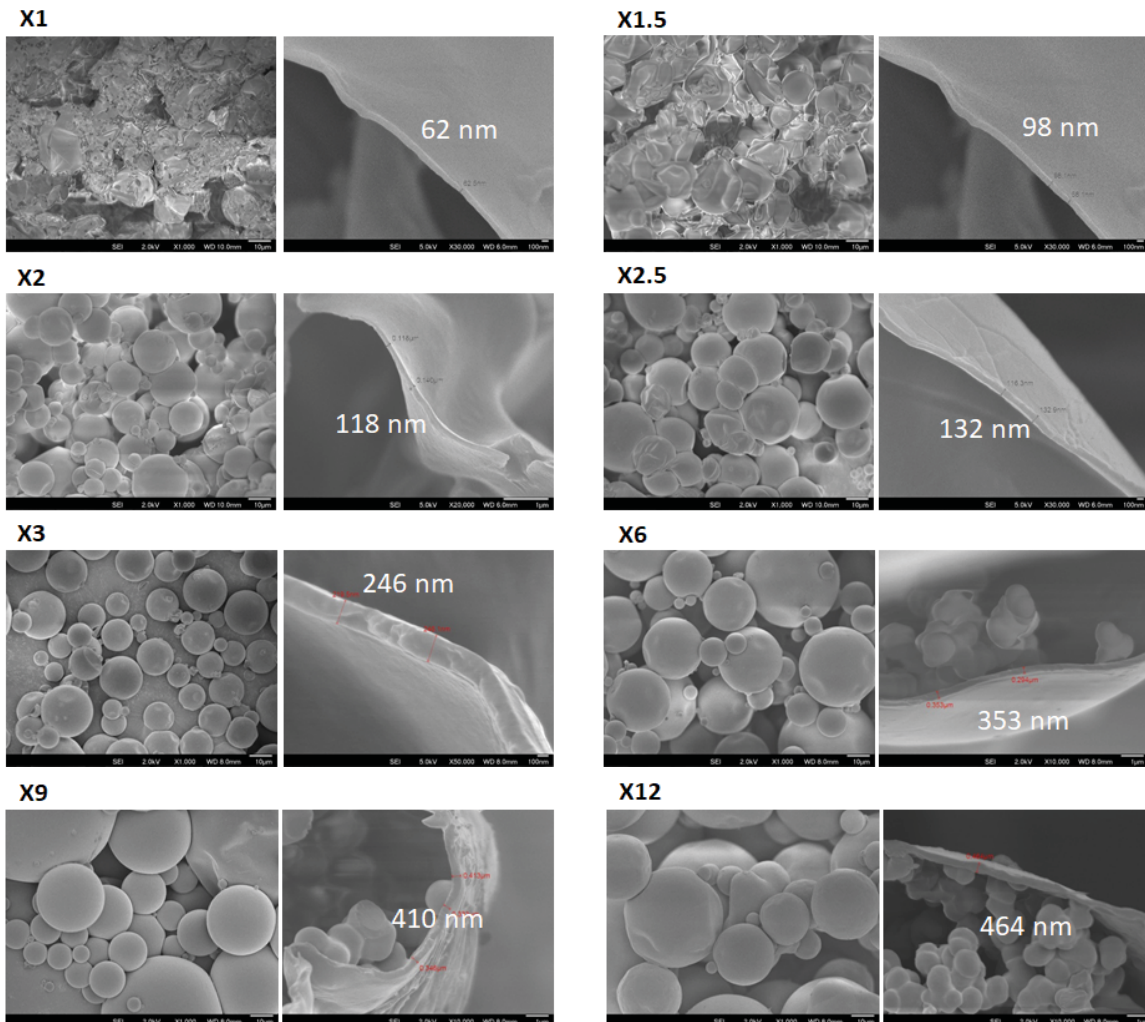


FIG. 9

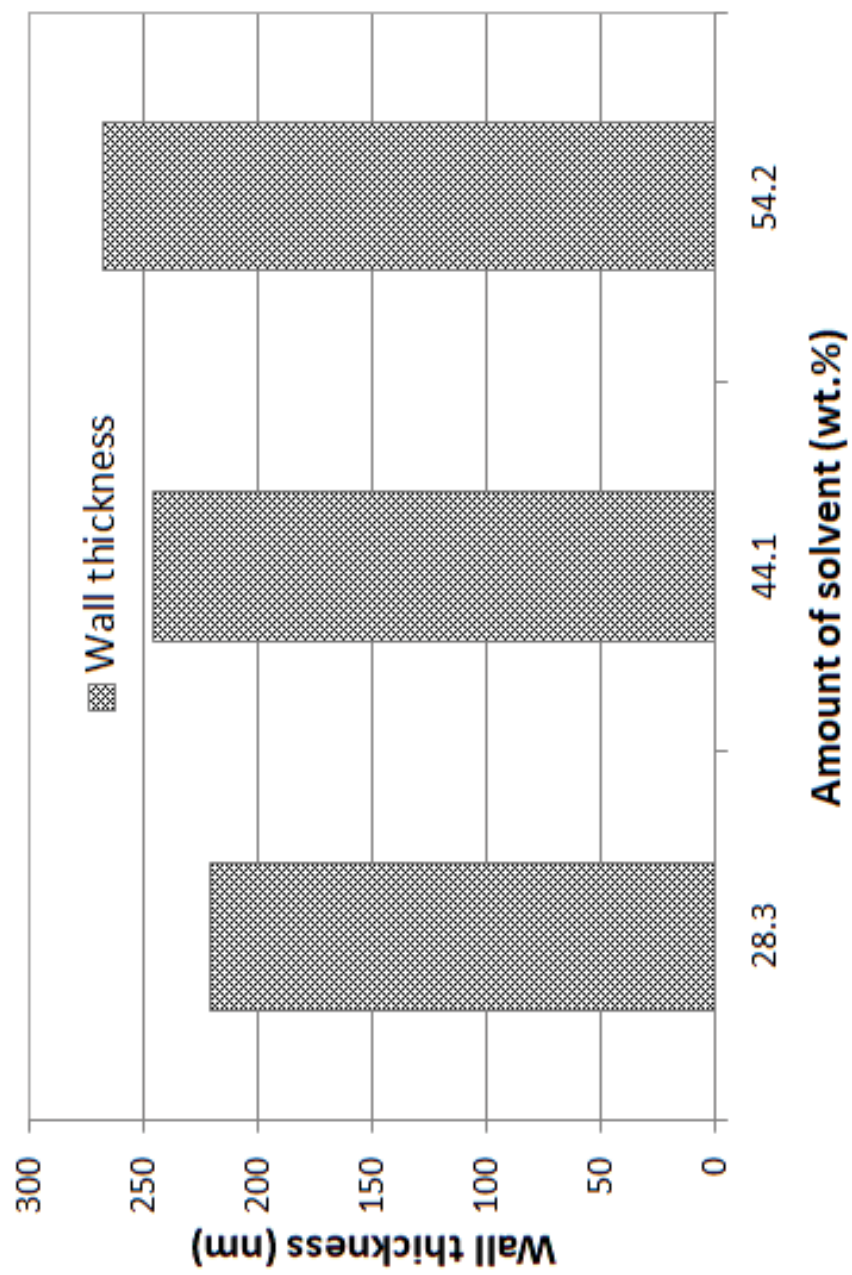
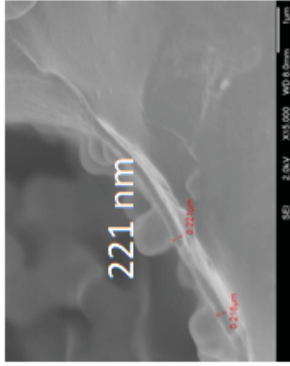
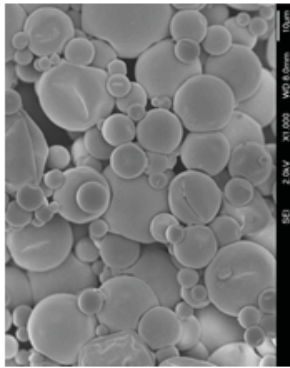
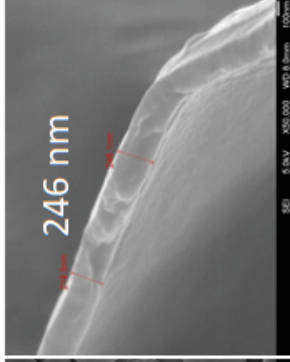
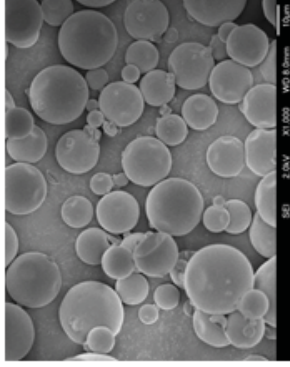


FIG. 10

Tributyrin – 28.3 wt. %



Tributyrin – 44.1 wt. %



Tributyrin – 54.2 wt. %

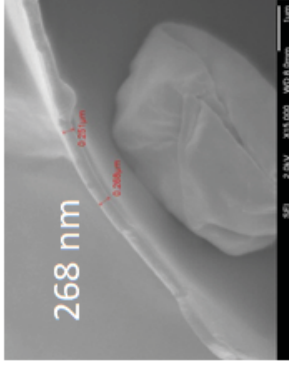
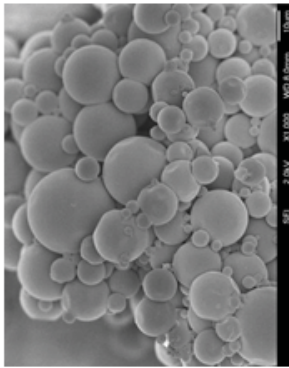


FIG. 11

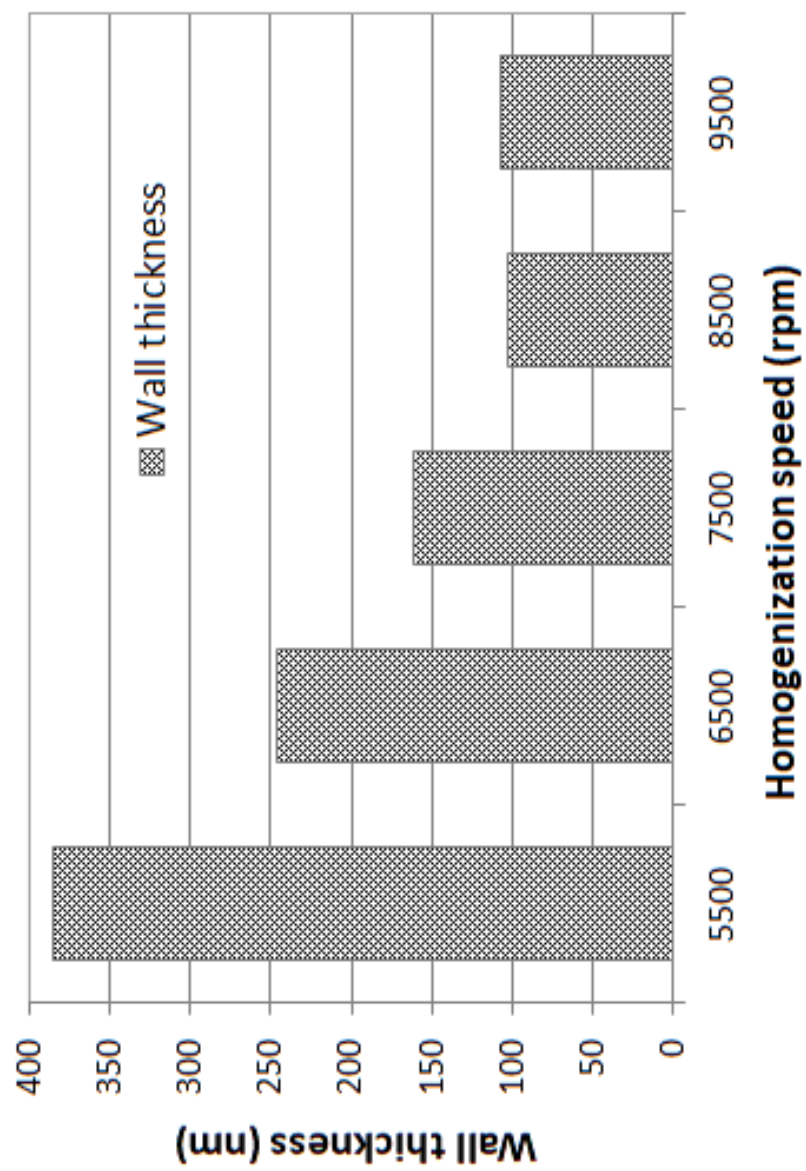
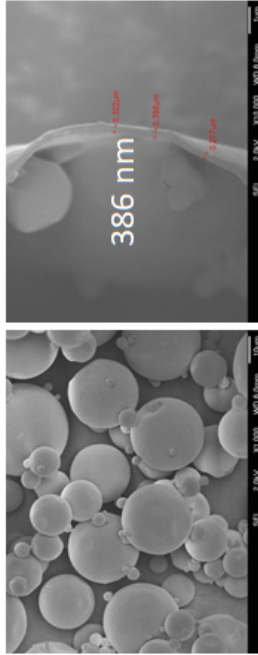
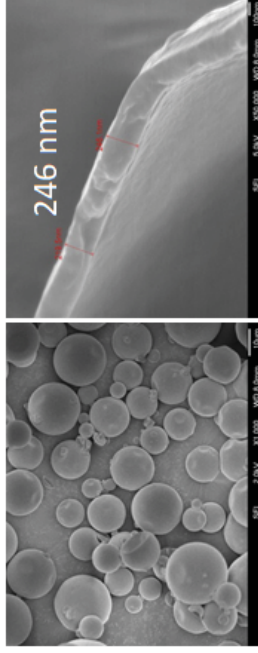


FIG. 12

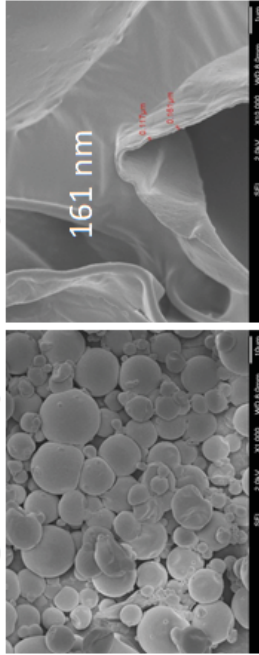
Homogenization speed – 5500 rpm



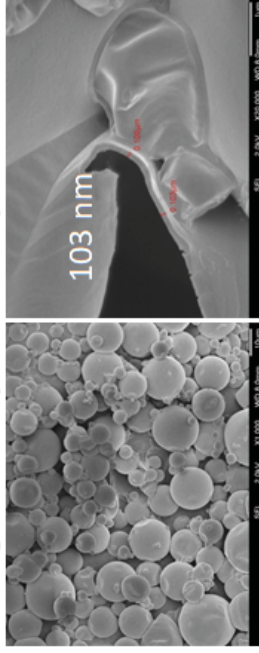
Homogenization speed – 6500 rpm



Homogenization speed – 7500 rpm



Homogenization speed – 8500 rpm



Homogenization speed – 9500 rpm

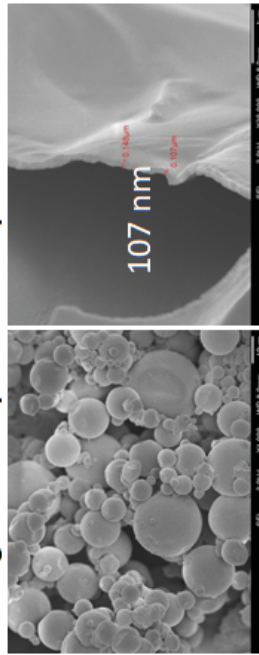


FIG. 13

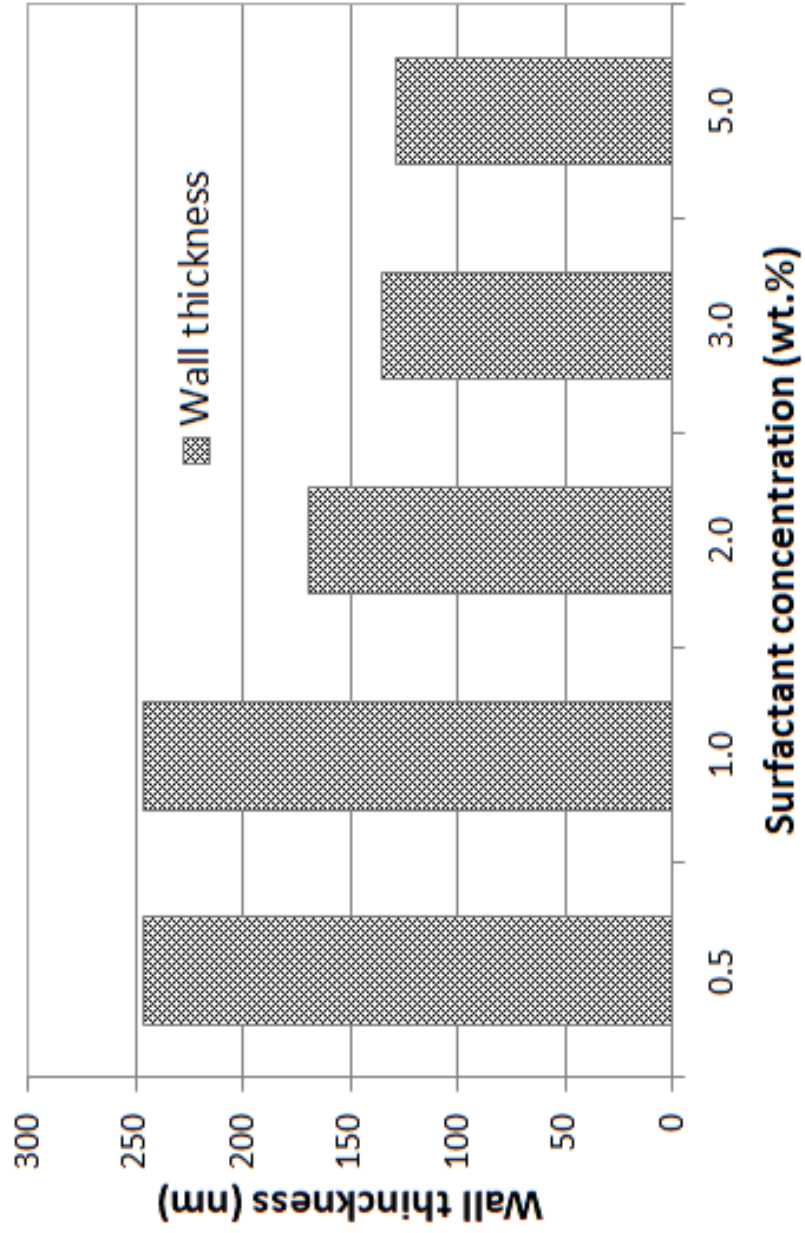
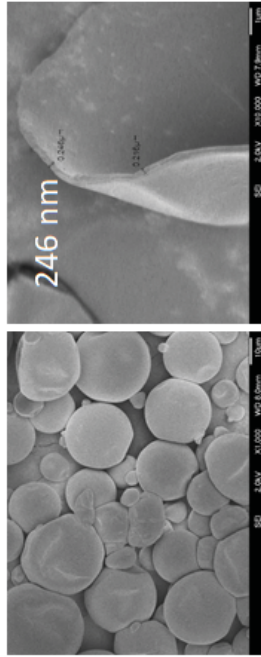
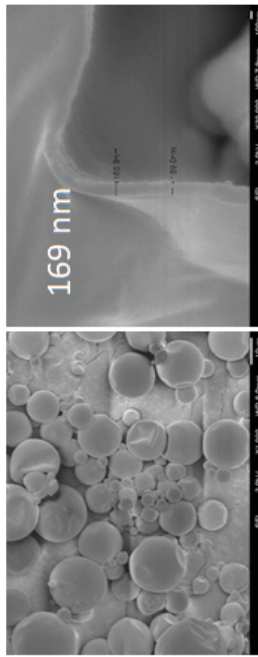


FIG. 14

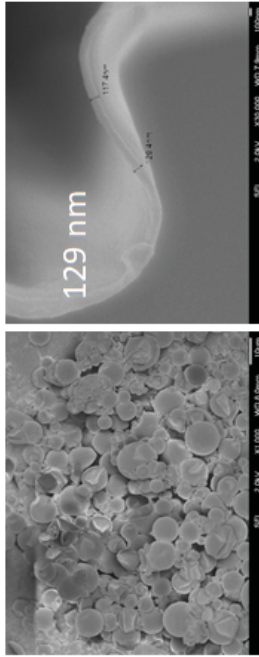
Surfactant concentration – 0.5 wt. %



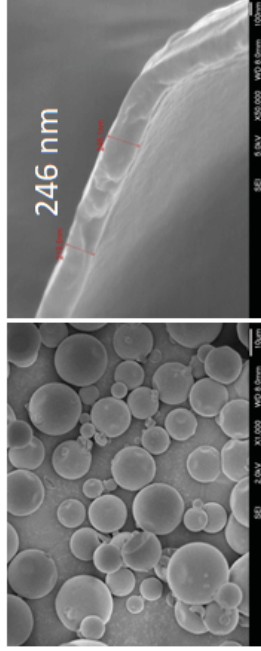
Surfactant concentration – 2 wt. %



Surfactant concentration – 5 wt. %



Surfactant concentration – 1 wt. %



Surfactant concentration – 3 wt. %

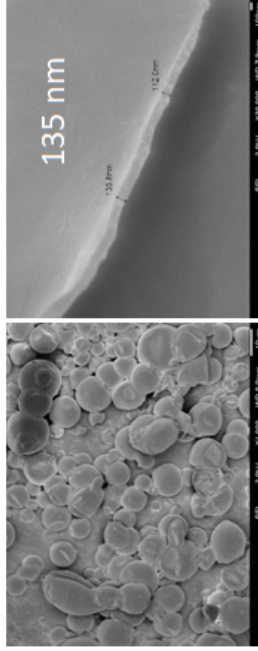


FIG. 15

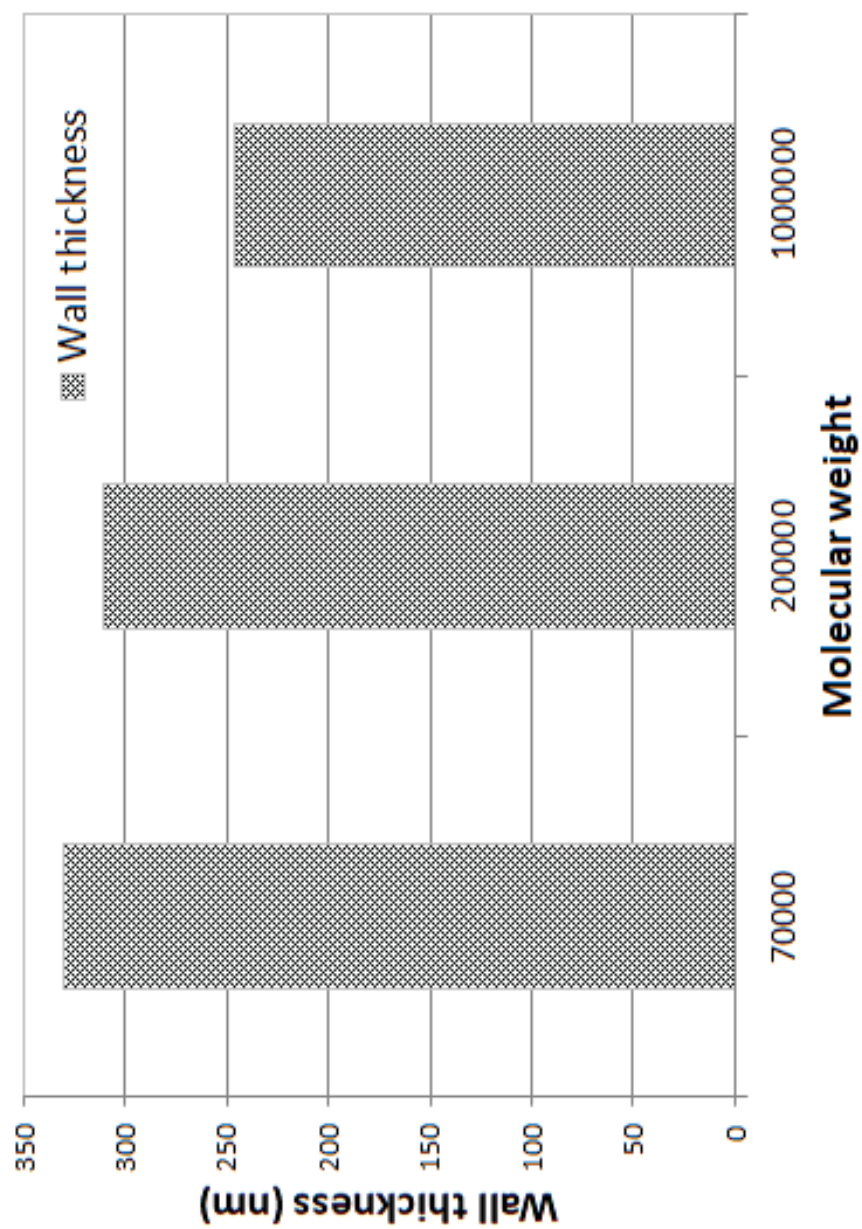
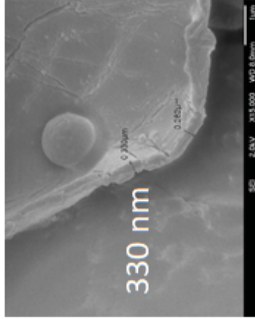
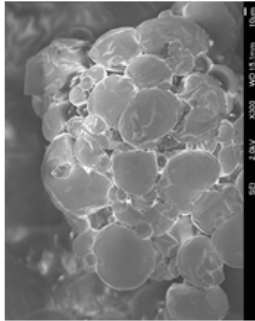
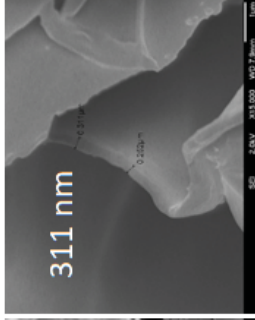
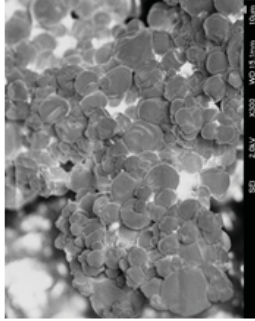


FIG. 16

Molecular weight – 70, 000



Molecular weight – 200, 000



Molecular weight – 1000, 000

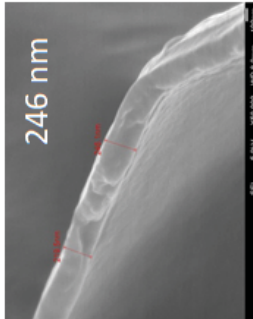
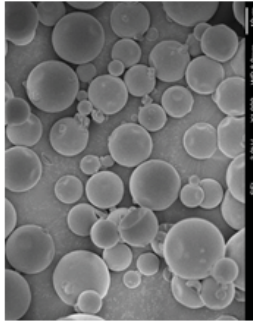


FIG. 17

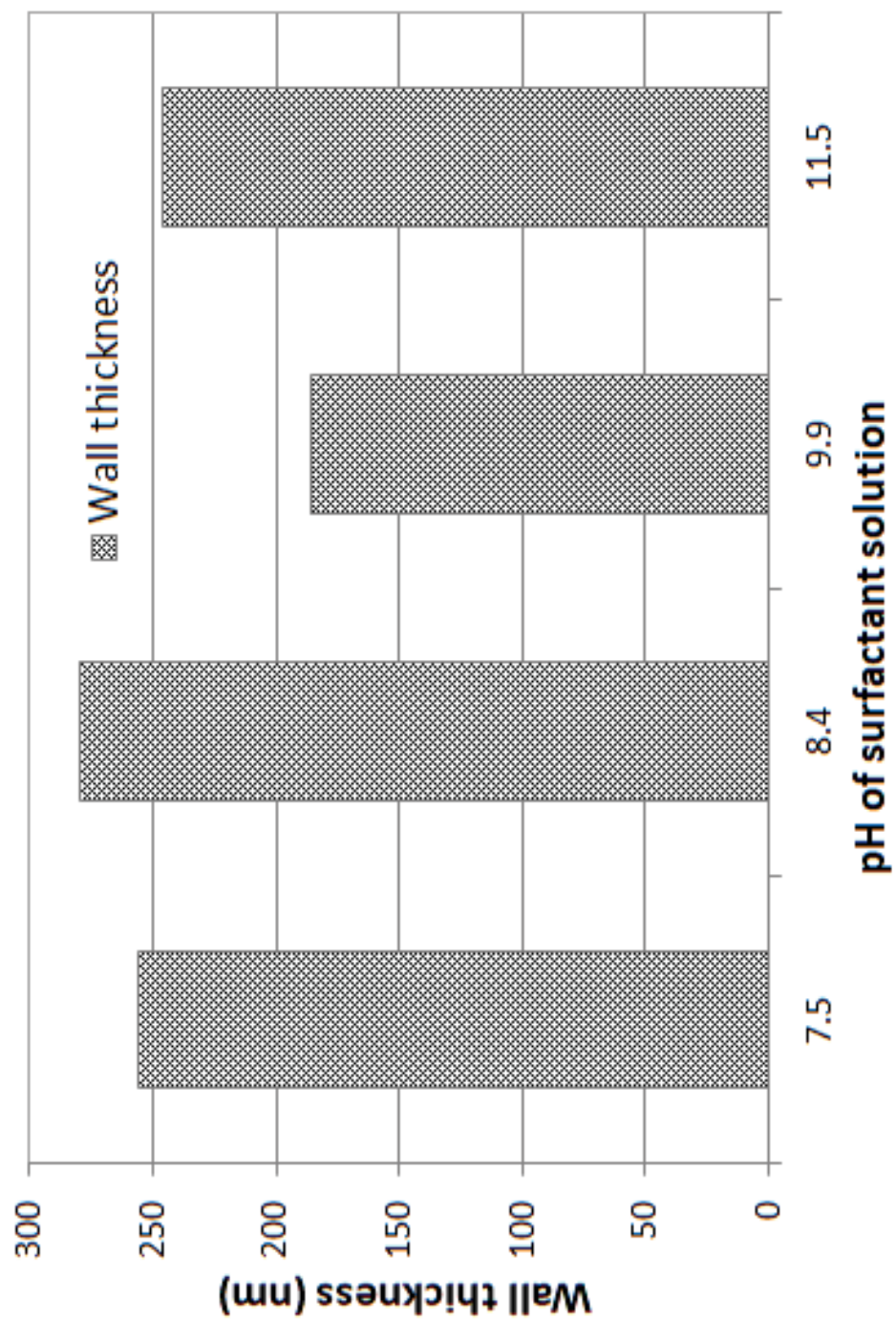
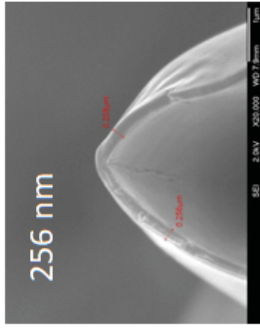
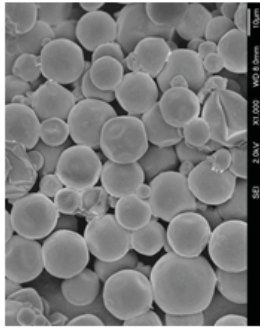
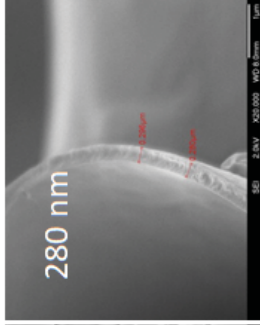
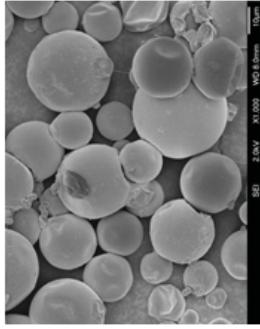


FIG. 18

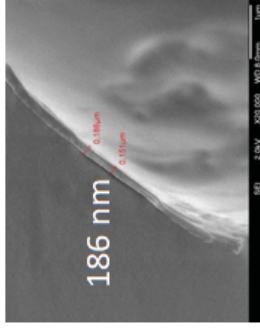
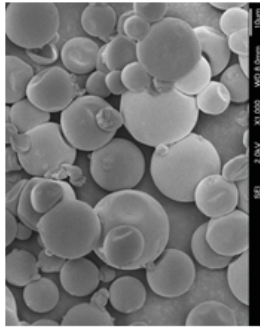
pH - 7.5



pH - 8.4



pH - 9.9



pH - 11.5

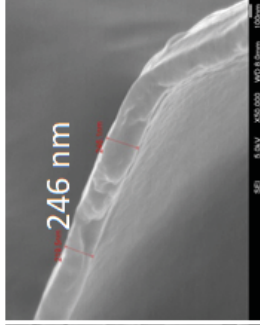
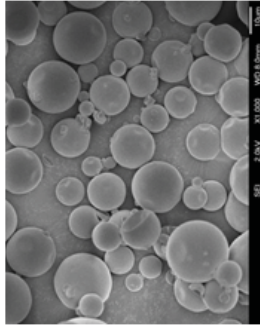


FIG. 19

